



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/938,260	08/23/2001	Steven W. Russell	TI-25084	1259

23494 7590 11/04/2002

TEXAS INSTRUMENTS INCORPORATED
P O BOX 655474, M/S 3999
DALLAS, TX 75265

EXAMINER

FENTY, JESSE A

ART UNIT	PAPER NUMBER
----------	--------------

2815

DATE MAILED: 11/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/938,260

Applicant(s)

RUSSELL ET AL.

Examiner

Jesse A. Fenty

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 18-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-17 in Paper No. 4 is acknowledged.
2. Claims 18-27 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 4.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 5-7, 9-13 and 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Hasegawa (U.S. Patent No. 5,646,440).

In re claims 1 and 11, Hasegawa discloses a semiconductor device, comprising:

A plurality of solid-state electronic devices;

A plurality of conductive elements (14) electrically coupling the electronic devices;

A dielectric layer (16) positioned between two or more of the conductive elements; and

A liner (15) including silicon and nitrogen, the liner positioned between at least a portion of the dielectric layer and a conductive element.

Art Unit: 2815

In re claims 2 and 12, Hasegawa discloses the devices of claim 1 and 11 respectively, wherein the liner is oxynitride (column 4, line 29).

In re claims 3 and 13, Hasegawa discloses the devices of claims 1 and 11 respectively, wherein at least one of the conductive elements comprises a metallization line (column 7, lines 12-15).

In re claims 5 and 15, Hasegawa discloses the devices of claims 1 and 11 respectively, wherein the dielectric layer comprises an intralevel dielectric layer positioned between conductive elements in a level of the integrated circuit structure.

In re claims 6 and 16, Hasegawa discloses the devices of claims 1 and 11 respectively, wherein the dielectric layer comprises an interlevel dielectric layer positioned between conductive elements in different levels of the integrated circuit structure.

In re claims 7 and 17, Hasegawa discloses the devices of claims 1 and 11 respectively, wherein the dielectric layer comprises a fluorinated dielectric material (column 4, lines 46-48).

In re claims 9 and 10, Hasegawa discloses the device of claim 1. The limitations regarding how the conductive elements are formed are "product by process" limitations and are not given patentable weight. Applicant is reminded that, a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); *In re Marosi et al*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that

Art Unit: 2815

an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above caselaw makes clear.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa as applied to claim 1 above, and further in view of Schrantz et al. (U.S. Patent No. 5,650,639).

In re claims 4 and 14, Hasegawa discloses the devices of claims 1 and 11 respectively, but does not expressly disclose the conductive element comprising polysilicon. However, polysilicon is one of the better known contact materials in this art as disclosed by Hasegawa (108, 140) and it would have been obvious for one skilled in the art at the time of the invention to use a polysilicon interconnect for the purpose, for example, of better regulating the conductivity speed of the device.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa as applied to claim 1 above, and further in view of Chooi et al. (U.S. Patent No. 6,465,888 B2).

Art Unit: 2815

In re claim 8, Hasegawa discloses the device of claim 1, but does not expressly disclose the dielectric layer comprising PTFE. Chooi discloses a similar device to Hasegawa wherein the dielectric layer (220) comprises many fluorine-composing compounds, including PTFE. It would have been obvious for one skilled in the art at the time the invention was made to substitute PTFE for silicon-fluorine as Chooi discloses both materials are exemplary choices for low-k dielectrics in devices such as these for the purpose of enhancing device performance (Chooi; column 1).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nishiyama (U.S. Patent No. 6,207,486 B1); Subramanian et al. (U.S. Patent No. 6,445,072 B1); Maeda (U.S. Patent No. 6,281,113 B1) and Yuasa et al. (U.S. Patent No. 6,365,959 B2) all disclose similar inventions to the instant application.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jesse A. Fenty whose telephone number is 703-308-8137. The examiner can normally be reached on 5/4-9 1st Fri. Off.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 703-308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-746-3892 for After Final communications.

Art Unit: 2815

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Jesse A. Fenty
Examiner
Art Unit 2815


JAF
October 31, 2002


EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800